

ABSTRACT

Feed forward techniques can be used to improve optical metrology measurements for microelectronic devices. Metrology tools can be used to measure parameters such as critical dimension, profile, index of refraction, and thickness, as well as various material properties.

5 Three-dimensional feature characterizations can be performed, from which parameters can be extracted and correlations executed. Process fingerprints on a wafer can be tracked after each process step, such that correlation between profile and structure parameters can be established and deviations from specification can be detected instantaneously. A "feed forward" approach allows information relating to dimensions, profiles, and layer thicknesses

10 to be passed on to subsequent process steps. By retaining information from previous process steps, calculations such as profile determinations can be simplified by reducing the number of variables and degrees of freedom used in the calculation.